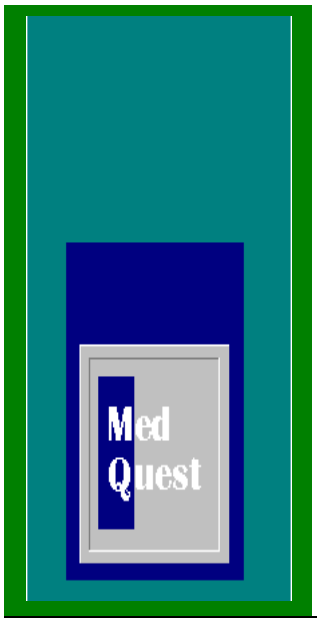

MEDQUEST SOFTWARE

METHODS FOR MEDICATION DATA COLLECTION: TECHNICAL PAPER # 5

September 30, 1998

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OVERVIEW

With the addition of several new design and data entry features for the latest release of the MedQuest software, the capability for medication entry has been significantly enhanced. Following is a general description of the options available for entering medications in MedQuest version 5.0.

NEW MEDQUEST MEDICATIONS DATABASE

A new, standardized medications database created from Multum, Inc.'s MediSource™ Lexicon database is now available. This database provides standard nomenclature for both prescription and over-the-counter medications. Due to space limitations, tables not utilized in the MedQuest data collection process (such as manufacturers and prices) have been dropped. Users still have the option to continue to use the medications database released with previous versions of MedQuest, either alone or in conjunction with the MediSource™ Lexicon.

NEW DESIGN FEATURES

There are several new options available in MedQuest version 4.10 and subsequent releases (i.e., improved design flexibility) that can be used for collection of high quality medication data. There is more design flexibility than exists in previous versions of MedQuest. During module design, the user can designate either the MediSource™ Lexicon or the old MedQuest medications database as the default. If the new database becomes the default, the old database can be used optionally for lookup.

MEDICATION VARIABLES

OPTION VARIABLES (YES / NO / UTD)

At times it may be advantageous to collect medication data in this format rather than collecting medications by name. For example, parent/child relationships are easy to implement with this type of variable.

There are two design options for this variable type.

- In pre-4.10 versions of MedQuest and also in the current release, the designer may add a list of acceptable medications to the help screen during design. This list can be compiled directly from the medications database provided with MedQuest. During data collection, the user can click the right mouse button to bring up the help for the variable and view the list.
- A new feature enables the designer to create a popup search aid. This allows the user to enter the name of a medication into a search box to see if that name exists in the database.

The old MedQuest Medications database provides 40 drug categories that can be searched. The new Multum MediSource™ Lexicon database provides 210 categories. Users can search either alphabetically or click on the <SEARCH FOR ALL> button to scroll through the entire list of the selected category or categories. Note that the search list can only be created from existing categories.

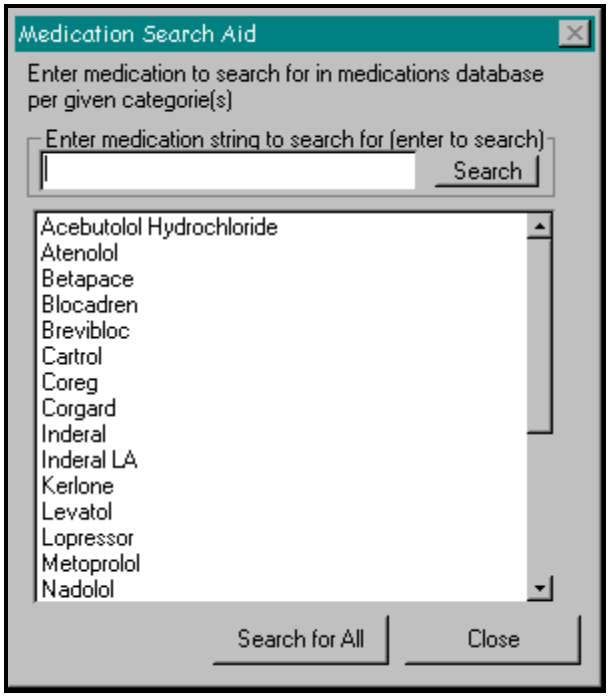

Figure 1: Medication Search Aid

Example 1: Collect information on whether a patient received beta blockers by creating a variable entitled “Beta Blockers Given”. Use the feature in the help editor to add a list of medications to the variable help. Select the class entitled “beta-adrenergic blocking agents”. This adds a list of acceptable medications to the help for that variable. This list can be edited.

Example 2: For the variable described in Example 1, use the design feature to create a popup search aid for the Option (Pick One) variable. Select the class entitled "beta-adrenergic blocking agents" to create the list. When the user clicks on the right mouse button, the search aid will pop up on the screen.

CUSTOM MEDICATION LISTS

A new feature in MedQuest enables the designer to build a custom medication list that can be used to search a specific list of medications during entry of medications into a grid. The custom lists are stored as tables in the module's data dictionary. The lists can either be built by selecting names from the old MedQuest Medications database, the new Multum MediSource™ Lexicon database, by manually entering any medication name, or a combination of all three. The data abstractors can add *only* medications that are found in the custom list. When the user searches for a medication, only the custom medication database is searched for a match, and the larger, more inclusive database is bypassed. The ability to add to the grid related questions that can be answered for each medication entered (e.g., date administered) still exists. In addition, the user can force a question to be answered *only* for a given classification.

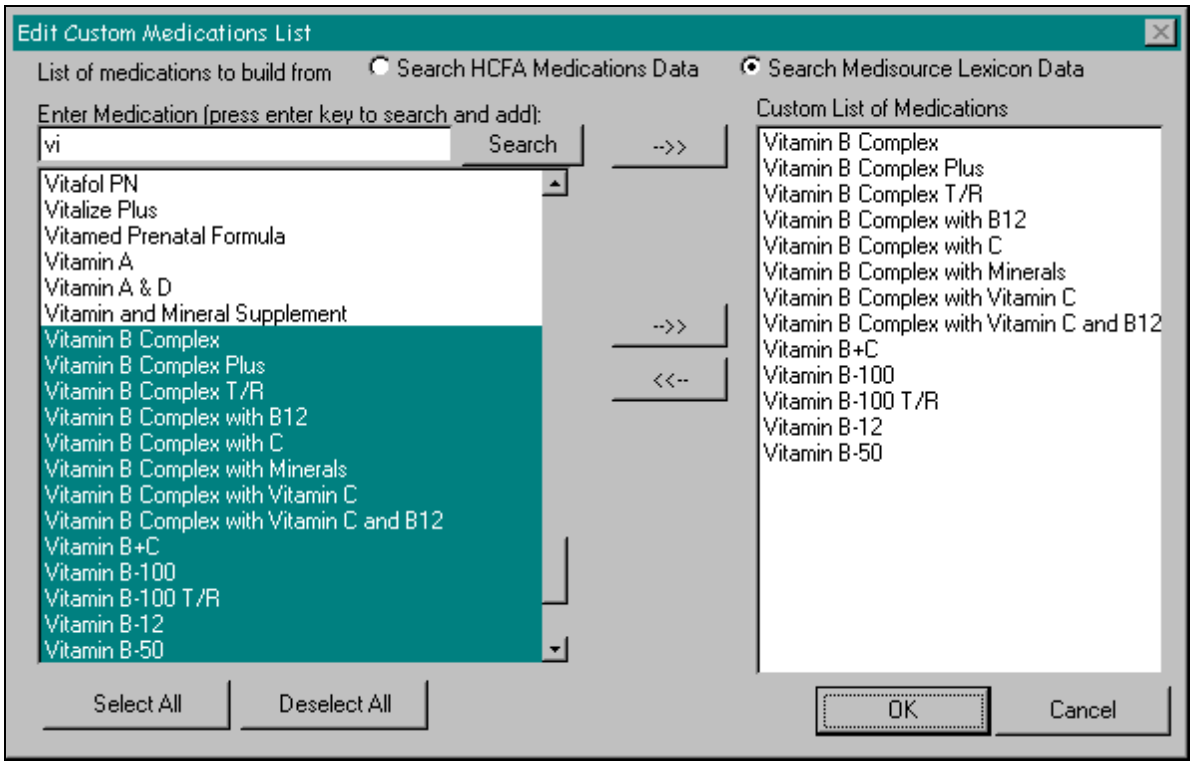

Figure 2: Custom Medication List Editor

The designer can add entries to the list manually by typing the medication into the search box and clicking on the top arrow that points to the custom list. An example of a medication that a designer may want to enter is the thrombolytic medication TPA, which is neither a trade name nor a standard generic name, that is often found in medical records. This name is found in the old MedQuest Medications database but not in the MediSource™ Lexicon database. If the designer elects to use only the MediSource™ Lexicon database for medication data entry, he/she can add TPA to the custom list if they wish.

This option is best used for a given class of medications (e.g., thrombolytics) and not for general medication data entry. Related questions can be answered regardless of the medication entered from

the list. If the user wants to answer certain related questions for different medication classes (e.g., start date for heparin, dosage for warfarin, stop date for aspirin) the custom list may not be the optimal design choice. Since the medications must be searched individually to build a custom list, the process can become quite laborious if you are compiling a long list.

USING AND MAINTAINING THE OLD MEDQUEST MEDICATIONS DATABASE

Database Structure

This database includes over 30,000 medication names. These names include misspellings and common abbreviations. Many of the names were added as a result of frequent entry in pilot studies. Each trade name has one generic (or combination generic) associated with it.

Example 1: Tylenol® w/codeine has the generic combination codeine/apap (abbreviation for acetaminophen). The database contains many records that represent Tylenol® w/codeine that are basically duplicate entries.

Example 2: Asparin, a misspelling of aspirin was added to the database since it has been found in medical records and abstractors are sometimes trained to enter medications exactly as they appear in the records. TPA, an abbreviation for a commonly used thrombolytic, was also added.

The maintenance of the medications database and the addition of the misspellings and abbreviations was not performed using any industry standard list or protocol. Therefore, this database can be viewed as a very large custom list.

The generic (and generic combinations) are used to classify medications into categories such as antibiotics, calcium channel blockers, etc. This database currently includes 40 classes. Some of these classes carried over from the MQIS module development projects performed for the Health Care Financing Administration.

Maintenance

Not all medications are classified, but the option for creating new classes still exists. Use the "Medications Maintenance Utility" in the MedQuest designer to modify the old MedQuest Medications database. See the MedQuest documentation for information on how to use this utility.

Data Entry

The database can be searched either in its entirety or for selected medication classes during medication entry. The user also has the ability to accept or reject (with or without override warning) a duplicate generic medication entry. The user has the option to select either the brand name or the ingredient name from the database.

Example: Entering ASA and aspirin in the same grid will issue a warning if the option to prevent entry of duplicate generics has been selected during module design.

USING THE MEDISOURCE™ LEXICON MEDICATIONS DATABASE

Database Structure

The Multum MediSource™ Lexicon Database is a relational medications database made available to users who will give credit to Multum, Inc. for its use. It is built primarily from the FDA National Drug Codes Directory database, available in the public domain, as well as pharmaceutical industry sources. Currently a subset (about 3.5 MB) is being used from the full 35 MB database. No modifications have been made to the data but additional tables have been created from the original data using SQL to speed up processing during MedQuest data entry. These are: category_brand, that joins the MediSource™ Lexicon categories with brand names; category_ingredient, that joins the categories with the active ingredient listed for each brand name; brand_generic which joins the brand name with the Multum drug name (a user-friendly version of the generic name); and category_dname, which joins the numeric categories, brand names, and the Multum drug name.

Note: The category_ingredient table displays certain items used in combination with substances that are pharmacologically active in different ways, e.g., dextrose is frequently listed as an active ingredient in various classifications because it is used in many parenteral solutions such as dopamine and xylocaine.

This database has been added to MedQuest to provide an industry standard alternative to the old MedQuest Medications database. The new database provides a predefined set of medication classes and the ability to link to additional drug information such as NDC codes. This database has over 8,500 brand names with no misspellings or abbreviations included (unless they are manufactured as such) and each brand name has one or more generic ingredients associated with it.

Example: Tylenol w/codeine has separate records in the active ingredients table for each of its main ingredients, codeine and acetaminophen ingredients. The brand names, rather than ingredient names, are used to classify medications into classes such as antibiotics. This database includes 210 classes, and some of the classes contain subclasses.

Data Entry

MedQuest provides options to search the entire database or search for a given class of medication during data entry. The user may accept or reject (with or without override warning) a duplicate brand name (trade name) medication entry.

When the user searches for a given medication in the new database, the search is done using the brand name list and the ingredients list. Unlike the old MedQuest Medications database, the ingredients (generics) are not combined with the brand names (trade names) in one list. This separation improves the processing speed. If the designer has selected the option to include the old MedQuest Medications database to be searched, abbreviations and misspellings will still be available for verification.

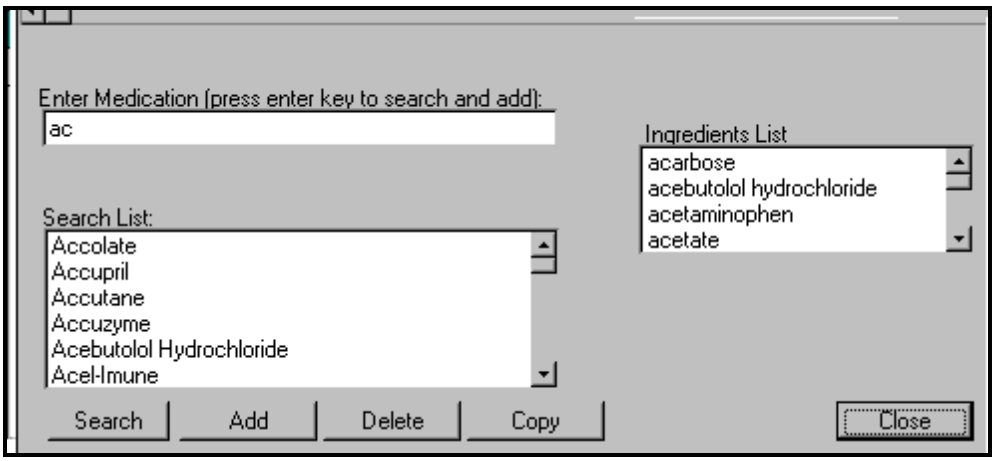

Figure 3: Medication Entry Search Screen

Maintenance

To insure the integrity of the MediSource™ Lexicon database, MedQuest does not provide any maintenance utilities. The vendor provides updates on a regular basis.